

Conclusion: Transforming Cities

Scientists and Stakeholders: Essential Partners in Urban Climate Change Mitigation and Adaptation

This ARC3.2 volume focuses on the pathways required for cities to fulfill their potential as climate change response leaders. Cities have an extraordinary potential for transformational change due to their concentration of economic activity, dense social networks, human resource capacity, high levels of investment in infrastructure and buildings, relatively nimble local governments, close connection to surrounding rural and natural environments, and tradition of innovation. As a result, cities can become active players on the world's stage to respond to the new calls coming for enhanced movement toward sustainability. Indeed, cities are increasingly both the centers of investments and economic activities as well as the source of potential solutions to the global sustainability crisis.

The period 2015–2016 was a watershed moment for global sustainability efforts. During this time, a worldwide consensus has emerged that global climate change is now under way, and the world's populations and ecosystems are experiencing the impacts of more frequent extreme events and gradual shifts in the everyday climate. Coupled with accelerating and globally significant biodiversity loss and unprecedented levels of urbanization, human migration, and commerce, we have entered into what many have described as new geological epoch: the *Anthropocene*.

At the same time, several significant global agreements put forward during the 2015–2016 period provide significant benchmarks and capacity for understanding the current trajectory and motivating forward action. In March 2015, the global community came together to ratify the Sendai Framework for Disaster Risk Reduction that provides protocols for addressing extreme events and threats to sustainability.

On September 25, 2015, countries of the world adopted the Sustainable Development Goals (SDGs) agenda designed to help end poverty, protect the planet, and ensure prosperity for all. Each goal has specific targets to be achieved over the next 15 years. With the adoption of the SDGs in September 2015, especially SDG 11 – ‘To make cities inclusive, safe, resilient, and sustainable’ – much of the discussion has focused on how cities can move toward greater sustainability.

Less than 3 months later, in December 2015, the UN and representatives from almost all of the world's countries ratified a comprehensive Climate Agreement at COP21 just outside of Paris.

And, in October 2016, the urban community came together for Habitat III, to define ways to promote sustainable urban development, including climate change actions.

The ARC3.2 presents a clear five-fold set of pathways to the urban transformation needed to fulfill the mandates from the international agreements. These pathways provide a foundational framework for the successful development and implementation of climate action. Cities that are making progress in transformative climate change actions are following many or all of these pathways.

The pathways can guide the way for the hundreds of cities – large and small; low-, middle-, and high-income – throughout the world to play a significant role in climate change action and sustainability. Cities that do not follow these pathways may have greater difficulty realizing their potential as centers for climate change solutions. The pathways are:

Pathway 1 – Integrate Mitigation and Adaptation: *Actions that reduce greenhouse gas emissions while integrating increasing resilience are a win-win.* Integrating mitigation and adaptation deserves the highest priority in urban planning,

urban design, and urban architecture. A portfolio of approaches is available, including engineering solutions, ecosystem-based adaptation, policies, and social programs. Taking the local context of each city into account is necessary in order to choose actions that result in the greatest benefits.

Pathway 2 – Coordinate Disaster Risk Reduction and Climate Change Adaptation: *Disaster risk reduction and climate change adaptation are the cornerstones of resilient cities.* Integrating these activities into urban development policies requires a new, systems-oriented, multi-timescale approach to risk assessments and planning that accounts for emerging conditions within specific, more vulnerable communities and sectors, as well as across entire metropolitan areas.

Pathway 3 – Co-generate Risk Information: *Risk assessments and climate action plans co-generated with the full range of stakeholders and scientists are most effective.* Processes that are inclusive, transparent, participatory, multisectoral, multijurisdictional, and interdisciplinary are the most robust because they enhance relevance, flexibility, and legitimacy.

Pathway 4 – Focus on Disadvantaged Populations: *Needs of the most disadvantaged and vulnerable citizens should be addressed in climate change planning and action.* The urban poor, the elderly, women, minority, recent immigrants, and otherwise marginal populations most often face the greatest risks due to climate change. Fostering greater equity and justice within climate action increases a city's capacity to respond to climate change and improves human well-being, social capital, and related opportunities for sustainable social and economic development.

Pathway 5 – Advance Governance, Finance, and Knowledge Networks: *Advancing city creditworthiness, developing robust city institutions, and participating in city networks enable climate action.* Access to both municipal and outside financial resources is necessary in order to fund climate change solutions. Sound urban climate governance requires longer planning horizons and effective implementation mechanisms and coordination. Connecting with national and international capacity-building networks helps to advance the strength and success of city-level climate planning and implementation.

A final word on urgency: Cities need to start immediately to develop and implement climate action. The world is entering into the greatest period of urbanization in human history, as well as a period of rapidly changing climate. Getting started now will help avoid locking-in counterproductive long-lived investments and infrastructure systems and will ensure cities' potential for the transformation necessary to lead on climate change.

The connections between the academic researcher and urban practitioner communities on the topic of climate change have developed rapidly in recent years, as has the demand for frameworks that promote opportunities for collaborative, co-generation of new knowledge that in turn leads to improved evidence-based

and implementable climate adaptation and mitigation actions. A multifaceted framework is emerging for promoting practitioner–scientist interaction that accelerates the successful co-generation of new climate risk, adaptation, and mitigation knowledge within individual cities and across multiple cities. The framework has emerged out of the process for science–policy interactions through the Urban Climate Change Research Network (UCCRN) and the creation of the ARC3.2.

This integrated framework represents a new *modus operandi* for urban practitioner–scientist interactions at local, regional, and global scales that enables scientifically rigorous, locally based, demand-driven, collaborative new knowledge-generating processes and actions. The need for this new approach was highlighted recently by the IPCC (IPCC, 2016). The framework includes several nested components: (1) city practitioner–scientist panels, (2) regional knowledge and information transfer hubs, (3) a network of networks, and (4) global urban assessments.

These components have emerged as climate change has grown to be an urban policy issue over the past 15 years (Rosenzweig and Solecki, 2001). Their development has been responsive to different interests and opportunities within specific cities, across sets of cities, and within national and international networks of cities. These processes need to be strengthened and interconnected to leverage these linkages for more rapid and transformative climate action. While a foundational component of the framework is local practitioner–scientist collaborative knowledge co-generative partnerships (here defined as the City Panels on Climate Change), a crucial element in the success of these partnerships will be network connections with other cities locally and globally and a sustained assessment process that ensures benchmarked learning through time.

The City Panels are where new knowledge is generated and implemented, and they represent a foundational unit of the framework. City Panels can be connected to any number of existing city-focused, climate change-related networks including the Large Cities Climate Leadership Group (C40), ICLEI—Local Governments for Sustainability (ICLEI), and the United Cities and Local Governments (UCLG) among others, but, for full effectiveness, should be connected to a network explicitly focused on linking practitioner–scientist panels. This type of network provides a horizontal organizational infrastructure to promote new knowledge and experience collection and transfer. Regional hubs can provide a mechanism to accelerate knowledge transfer, experience acquisition, and climate action among cities across regions. The panel network can be connected to the existing international urban climate change networks and describe how the framework enables the continued growth and expansion of new knowledge and actionable science without which the Paris Climate Change Agreement goal of 2°C and the SDG 11 for sustainable cities will be difficult to achieve.

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